

**HSS Independent Activity Report - Rev. 0****Report Number:** HIAR-RL-2011-06-17**Site:** DOE-Richland  
Operations Office**Subject:** Office of Enforcement and Oversight's Office of Safety and Emergency  
Management Evaluations Activity Report for the Sludge Treatment Project**Dates of Activity :** 06/13/2011 – 06/17/2011**Report Preparer:** Jake Wechselberger**Activity Description/Purpose:**

The U.S. Department of Energy's (DOE) Office of Enforcement and Oversight, within the Office of Health, Safety and Security (HSS), performed operational awareness reviews of the Sludge Treatment Project (STP), Engineered Container Retrieval and Transfer System (ECRTS) during site visits.

**Result:**

During the period June 13-17, 2011, an HSS representative participated in tours of the STP test facility. The HSS representative was also briefed by the CHPRC STP Test Director and the DOE-Richland Operations Office principal support contract engineer.

HSS witnessed the qualification test, demonstrating the final size separation of the pretreatment processing of the Knock Out Pot (KOP) material. This was conducted on the size separation table in the screened separation unit located in the Maintenance and Support Facility (MASF) test facility. This test demonstrated the removal of additional particles less than 600 microns from the KOP material stimulant. During this process the material was evenly distributed on the screen table and agitated with a nozzle array. The remaining material, principally uranium stimulant, was moved into the verification loading station. In the verification loading station, the material was swept into the verification containers. Next, the verification containers were weighted, leveled, and the volume measurement taken. This provides a determination of the bulk wet density of the KOP material and thus supports the Multi-Canister Overpack (MCO) safety basis loading analysis. The MCO loading analysis is derived from and provides a basis for other safety analysis including gas generation and MCO pressurization, thermal stability, and criticality analyses.

The weight scale, verification container, and volume measurement tool used to determine KOP material density are classified as Office of Civilian Radioactive Waste Management (OCRWM) and safety significant equipment. The volume measurement device is a mechanical device built for this specific volume determination. To obtain a volume reading, an operator is required to read a measurement scale. This scale is located approximately 22 feet above the depth pad housing placed on top of the KOP material in the verification container. It was observed, during the volume measurement, that two separate readings taken by two individuals differed slightly.

With respect to MCO loading, KOP material density determinations, and volume and weight measurements, an uncertainty analysis has been performed to determine the maximum uncertainty in the calculation of KOP material density with respect to possible uncertainties inherent in equipment and human factors. This analysis includes uncertainty in the volume measurements determination, such as scale parallax error, angular misalignment between the volume measurement tool and the verification container and particle interference with the volume measurement tool and verification container interface. HSS witnessed the demonstration of the operator's ability to detect particle interference at the volume measurement tool and verification container interface.

Contractor QA representatives were present to witness this demonstration test.

The HSS representative walked down major components of the STP test facility housed in the MASF.

During this period, the project was considering various operational methods to reduce the turbidity while decanting the Sludge Transport and Storage Container (STSC). The project conducted transfers of KE (K East Basin) simulant from the test Engineered Container into the STSC followed by the decant operation.

The KE stimulant has exhibited higher turbidity concentrations than previously tested stimulants. The requirement is to reduce the turbidity to less than 214 NTU (Nephelometric Turbidity Units are an indicator of suspended solids and water clarity), before returning decant back to the test pool. The project attempted to reduce the decant NTU by utilizing different flocculent injection points and concentrations combined with various STSC settling times. In addition, a high capacity 3M filter was added in order to achieve the required NTU level.

The STP Test Director briefed the HSS representative on this issue, as well as the following items.

The project will re-configure and human factor the operator control panel.

During a loss of power test, a line plugged and could not be immediately cleared. A design change was recommended by the test coordinator to facilitate clearing line plugs.

The HSS representative also attended the Sludge Treatment Project Safety Design Integration Team June Administrative Meeting. During the meeting, a detailed review of the STP Field Execution Schedule, including the status of significant activities, was conducted. During the meeting, the following project submittals were identified: KOP K Basin Safety Analysis Report (SAR)/Technical Safety Requirements (TSR), November 2011; KOP CVDF SAR/TSR, November 2011; and the Preliminary Safety Design Report, September 2011. The meeting appeared to be comprehensive and effective in engaging functional and programmatic groups.

HSS Participants	References
1 (lead). Jake Wechselberger	
2. Don Prevatte	

Were there any items for HSS follow up? ☒ Yes ☐ No

**HSS Follow Up Items**

1. Continue operational awareness reviews of the Sludge Treatment Project.